

Postdoctoral Positions in Signal Processing and Machine Learning for Multimodal Molecular Imaging

Apply Now

Challenge: Build 3-D molecular atlases of human organs.

Change: Signal processing/machine learning for high-dimensional imaging.

Impact: Decipher spatiotemporal cellular diversity in human tissue

Job description

The Van de Plas lab is offering postdoctoral positions in signal processing and machine learning for multimodal imaging, to build 3-D molecular atlases of human tissue. The positions have a special focus on spectral imaging modalities such as imaging mass spectrometry and multiplexed immunofluorescence microscopy, as well as on exceptionally large and high-dimensional data.

Our lab is located at the Delft University of Technology (TU Delft) in the Netherlands and is part of the Delft Center for Systems and Control. Our research lies at the interface between (i) mathematical engineering and machine learning; (ii) analytical chemistry and instrumentation; and (iii) life sciences and medicine. We explore new ways of acquiring, processing, and mining the massive (multi-terabyte) datasets that imaging mass spectrometry and other molecular imaging modalities commonly deliver.

Research topics of interest for these positions include:

- Signal processing (e.g. noise removal, automated feature detection, etc.);
- Dimensionality reduction and transformations (e.g. Fourier & wavelet transforms, dictionary learning, etc.);
- Pattern recognition and factorization in large datasets (e.g. non-negative matrix/tensor factorization, etc.);
- Supervised, semi-supervised, and unsupervised machine learning (e.g. multivariate regression, tumor/abscess classification, manifold learning, etc.);
- Mathematical optimization & casting problems in biology into a computer-solvable form (e.g. convex optimization, automated anatomical interpretation);
- Data mining across different imaging sensors and technologies (e.g. data-driven multimodal image fusion).

Our lab has a strong network of international collaborators in both academia and industry. Collaborators include chemistry and instrument partners, such as the Mass

Spectrometry Research Center, Caprioli, and Spraggins labs at Vanderbilt University (Nashville, TN, U.S.A.), as well as medicine and biology partners.

You will have the opportunity to participate in one or more of our ongoing multidisciplinary research projects:

- Two projects within the Human BioMolecular Atlas Program (HuBMAP) of the United States' National Institutes of Health (<https://hubmapconsortium.org> & <https://doi.org/10.1038/s41586-019-1629-x>), which aims to build a 3-D molecular atlas of the human body at single-cell resolution. Both projects are in close collaboration with Vanderbilt University (Nashville, TN, U.S.A.).
- Two National Institutes of Health projects on the molecular imaging of microbial communities and infectious disease, in collaboration with the Vanderbilt University Medical Center (Nashville, TN, U.S.A.).
- SMART BRAIN, a FLAG-ERA JTC project in collaboration with the University of Modena and Reggio Emilia (Italy) through which our lab is an associated member of Europe's Human Brain Project Flagship.

Further info: <http://vandeplaslab.tudelft.nl>

Requirements

Applicants should have:

- A PhD degree in a relevant field, i.e. Engineering, Computer Science, Systems & Control, Statistics, Computational Physics, or any domain related to the lab's research topics.
- A background in image & signal processing, machine learning, numerical analysis, or statistics.
- Strong motivation to work in a multidisciplinary environment and interact with collaborators in medicine, biology, chemistry, and physics is essential.
- Good command of English is required.

Experience in mass spectrometry, chemistry, or biotechnology is a plus.

Conditions of employment

Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities (salary indication: € 4.036 - € 5.090 per month gross). The TU Delft offers a customisable compensation package, a discount on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged.

For international applicants, TU Delft has the [Coming to Delft Service](#). This service provides information for new international employees to help you prepare the relocation and to settle in the Netherlands. The Coming to Delft Service offers a [Dual Career Programme](#) for partners and they organise events to expand your (social) network.

This postdoc position has a temporary assignment of 2 years.

TU Delft (Delft University of Technology)

Delft University of Technology is built on strong foundations. As creators of the world-famous Dutch waterworks and pioneers in biotech, TU Delft is a top international university combining science, engineering and design. It delivers world class results in education, research and innovation to address challenges in the areas of energy, climate, mobility, health and digital society. For generations, our engineers have proven to be entrepreneurial problem-solvers, both in business and in a social context.

At TU Delft we embrace diversity as one of our core [values](#) and we actively [engage](#) to be a university where you feel at home and can flourish. We value different perspectives and qualities. We believe this makes our work more innovative, the TU Delft community more vibrant and the world more just. Together, we imagine, invent and create solutions using technology to have a positive impact on a global scale. That is why we invite you to apply. Your application will receive fair consideration.

Challenge. Change. Impact!

Faculty Mechanical, Maritime and Materials Engineering

From chip to ship. From machine to human being. From idea to solution. Driven by a deep-rooted desire to understand our environment and discover its underlying mechanisms, research and education at the 3mE faculty focusses on fundamental understanding, design, production including application and product improvement, materials, processes and (mechanical) systems.

3mE is a dynamic and innovative faculty with high-tech lab facilities and international reach. It's a large faculty but also versatile, so we can often make unique connections by combining different disciplines. This is reflected in 3mE's outstanding, state-of-the-art education, which trains students to become responsible and socially engaged engineers and scientists. We translate our knowledge and insights into solutions to societal issues, contributing to a sustainable society and to the development of prosperity and well-being. That is what unites us in pioneering research, inspiring education and (inter)national cooperation.

Click [here](#) to go to the website of the Faculty of Mechanical, Maritime and Materials Engineering. Do you want to experience working at our faculty? These [videos](#) will introduce you to some of our researchers and their work.

Additional information

For more information about these positions, please contact Dr. Raf Van de Plas (raf.vandepas@tudelft.nl).

Application procedure

Are you interested in this vacancy? Please apply via the application button by September 30 and upload:

1. a detailed curriculum vitae and a list of publications;
2. a letter of motivation and research interests (up to 1 page);
3. names and contact information of three academic references;
4. copies of your key publications.

The expected start date is as early as is practical.

This call for applications will remain open until the ideal candidates are found. However, for full consideration please apply by Sep 30th, 2023.

For information about the application procedure, please contact Ms. Irina Bruckner, HR Advisor, recruitment-3me@tudelft.nl.

Please note:

- A pre-employment screening can be part of the selection procedure.
- You can apply online. We will not process applications sent by email and/or post.
- Please do not contact us for unsolicited services.

[Apply Now](#)